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09/716,222	11/21/2000	Sang Chul Youn	214-169P	9409

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EXAMINER

WEST, JEFFREY R

ART UNIT PAPER NUMBER

2857

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/716,222

Applicant(s)

YOUN ET AL.

Examiner

Jeffrey R. West

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-9 and 11-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-9 and 11-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 21 January 2003 is: a) ☐ approved b) ☒ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08970455.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Applicant has not complied with one or more conditions for receiving the benefit of an earlier filing date under 35 U.S.C. 120 as follows:

The second application must be an application for a patent for an invention which is also disclosed in the first application (the parent or provisional application); the disclosure of the invention in the parent application and in the second application must be sufficient to comply with the requirements of the first paragraph of 35 U.S.C. 112. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ 2d 1077 (Fed. Cir. 1994). The parent application, 08/970,455, does not provide sufficient support, under the first paragraph of 35 U.S.C. 112, for claims 7, 8, 16, and 17 of the instant invention.

2. Acknowledgment is made of Applicant's claim for priority under 35 U.S.C. 119(a)-(d) based upon applications filed in the Republic of Korea on November 14, 1996, December 28, 1996, and December 28, 1996. A claim for priority for claims 7, 8, 16, and 17 under 35 U.S.C. 119(a)-(d) cannot be based on said applications, since the United States application was filed more than twelve months thereafter.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a) because they fail to show

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the necessary details for generating a noise control signal based on a residual noise signal and an error variation signal as described in the specification. Any structural detail that is essential for a proper understanding of the disclosed invention should be shown in the drawing. MPEP § 608.02(d). Specifically, in Figure 7 Applicant illustrates the description, "Mixer 105c of microcomputer part 105 calculates and outputs an error signal and an error variation signal of a residual noise signal by mixing the noise signal $X(k)$ output from the system 105a with the signal $Y(k)$ output from the CRCP". However, the drawing in Figure 7 shows a mixer that combines the signal from the system 105a with the signal from the CRCP only to form residual noise signal $E(k)$.

4. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

On page 2, lines 10-11, "for electric power simplifying" should be ---for electric power amplifying---.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 3, 7, 12, and 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

With respect to claims 7 and 16, it is unclear how the current "phase perceiving part" generates/outputs a phase signal. The applicant presents a "phase perceiving part", using a transformer, rectifier, pressure-sensitive circuit for conversion, and a band-pass filter. It is unclear how these components are included in the method pictured in Figure 6 and similarly unclear how these components alone would output a "phase signal" as claimed. The new description added to the specification does not cure these deficiencies.

Firstly, the corresponding description provides that the "noise signal A which is synchronized with the frequency of the voltage sensing part I is output through the noise source VI . . . The signal A with a rating voltage (220V or 110V) is decreased by the resistance of resistors R1 and R2 of the signal decreasing part II and is inputted into the bandpass filter part II." However, with reference to Figure 10, the noise signal is not sent to sections II or III, it is the voltage source that is sent through these sections. This implementation is also confusing since Applicant

describes “[i]n FIG. 10, B represents the noise and A represents the canceling noise”, a description not in accordance with the previously mentioned section.

More notably, it is unclear how this implementation can be used in accordance with the remainder of the claimed invention. According to the corresponding description, the “phase perceiving part” does not perceive a phase of the noise signal, but instead produces an entire canceling noise signal “output through the speaker V as a signal B.” Claims 7 and 16 then specifies using a micro computer part for “generating a noise control signal based on a residual noise signal and an error variation signal.” However, to carry out this method, as shown in Figures 6 and 7, the micro computer system must receive an input $X(k)$, the noise signal and it is then the CRCP that calculates a modified signal $Y(k)$ (original page 8, lines 20-21). If the “phase perceiving part” as described, and illustrated in Figure 10, outputs through a speaker a reverse signal B corresponding to signal $Y(k)$, it is unclear how the micro computer section can calculate the signal $Y(k)$ using a CRCP which calculates $Y(k)$ as a function of $X(k)$ and $E(k)$.

Further, claims 7 and 16 recite, “generating a noise control signal based on a residual noise signal and an error variation signal.” However since $Y(k)$ is the noise control signal (original page 8, line 20), $E(k)$ is the residual noise signal (page 9, line 2) and $\Delta E(k)$ is the error variation signal (page 9, line 2), this feature is not in accordance with the description which defines $Y(k)$ as a function of $X(k)$, the noise signal, and $E(k)$, the residual noise signal (amended page 8, lines 18+). For these

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reasons, it is unclear to one having ordinary skill in the art how to use the invention present in claims 7 and 16.

Claim 12 recites generating the noise control signal through the use of a look up table. This limitation is not mentioned in the specification and is not provided with any method for implementing this feature. Claim 3 recites, "wherein said microcomputer includes an index table". Again, there is not provided in the specification a sufficient method for using this limitation, only a mention in the description of Figure 9, which does not provide a thorough explanation. Figure 9 shows a neural net but does not provide how it is used to produce an index, or how/which values are arranged in the index. For these reasons claims 3 and 12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification to one having ordinary skill in the art.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 2, 5, 6, 11, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art in view of U.S. Patent No. 5,434,925 to Nadim.

The applicant admits as well known prior art, a conventional noise controller for actively controlling noise comprising a sensor part for perceiving the noise signal, a signal amplifying part for amplifying the perceived noise signal, a first low-pass filtering part for low pass filtering the amplified noise signal, a digital signal processor (i.e. a microcomputer part) for processing the amplified low pass filtered noise signal without phase delay, a second low-pass filtering part for low pass filtering a control noise signal from the digital signal processor, an electric power amplifying part for electric power amplifying the filtered noise control signal, and an output part for outputting the electric power amplified noise control signal (page 2, lines 1-12). The Applicant also admits as Prior Art the method of operation for the conventional noise controller as using the sensor part to perceive the noise signal, the signal amplifying part amplifying the noise signal perceived by the sensor part and outputting the amplified signal to the first low-pass filtering part, outputting the low-pass filtered noise signal to a DSP (i.e. micro-computer) which produces a control signal, having the same amplitude but opposite phase to the noise signal, for outputting (page 2, lines 15-21). Further, since the DSP produces the control signal having the same amplitude but opposite phase to the noise signal, it is considered inherent that the DSP must first perceive the phase before producing the signal. It is also noted that since the DSP is functioning as the microcomputer, by generating a noise control signal, and a phase perceiving part, in perceiving the phase of the input noise signal, the first low-pass filtering part is outputting a filtered noise signal to both the phase perceiving part and the microcomputer part.

The Applicant's Admitted Prior Art, however, does not teach generating a noise control signal based on both a residual noise signal (i.e. an error signal) and an error variation signal in order to minimize the residual noise signal.

Nadim teaches a method and apparatus for active noise reduction in which noise from an engine is cancelled by means of cancellation noise produced by a loudspeaker driven by a controller, the difference between the noise from the engine and the cancellation noise is detected as an error signal by means of a microphone, and the error signal is applied in a feedback loop to the controller so as to control the cancellation noise produced by the loudspeaker in a manner to minimize the error signal (column 2, lines 16-23). Nadim also teaches generating the noise cancellation signal (i.e. noise control signal) using a controller, functioning as a rule controlling part, that takes into consideration both the current error signal (i.e. residual noise signal) and a change in error signal (i.e. error variation signal) (column 3, lines 25-48 and 40-57). Further, with respect to claims 6 and 15, Nadim teaches generating an error signal by mixing the noise signal (N) with the noise control signal (C) (Equation 1) and, since the error variation signal is the difference between the current error signal and the previous error signal (equation 14), mixing the noise signal with the noise control signal also generates the error variance signal.

It would have been obvious to one having ordinary skill in the art to modify the invention of the Applicant's Admitted Prior Art to include generating a noise control signal based on both a residual noise signal (i.e. an error signal) and an error

variation signal in order to minimize the residual noise signal, as taught by Nadim, because, as suggested by Nadim, the combination would have provided a method for producing an iterative reduction of unwanted noise quickly (column 5, lines 40-57) and with fewer occurrences of the apparatus being driven out of the cancelled condition (column 1, lines 31-47).

10. Claims 3 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art in view of Nadim and further in view of U.S. Patent No. 4,630,305 to Borth et al.

As noted above, the invention of the Applicant's Admitted Prior Art and Nadim teaches many of the features of the claimed invention including calculating a noise control signal based on values of a residual noise signal and an error variation signal but does not teach using a look up table or an associated index.

Borth teaches a method and apparatus for suppressing background noise in speech communication systems by automatically selecting noise suppression gain factors (column 2, lines 47-64) wherein the gain values used in the noise suppression are obtained through use of a look up table (column 8, lines 47-51) and the look up table values are correspondingly indexed (column 11, lines 38-49).

It would have been obvious to one having ordinary skill in the art to modify the invention of the Applicant's Admitted Prior Art and Nadim to include using a look up table and an associated index, as taught by Borth, because look up tables are a well known tool for calculating an output based on a group of known inputs and, as

suggested by Borth, the combination would have provided easy and automatic method for determining unknown values based on known values using a method that can be implemented for a variety of environmental conditions (column 3, lines 20-35).

11. Claims 4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art in view of Nadim and further in view of U.S. Patent No. 5,583,968 to Trompf.

As noted above, the invention of the Applicant's Admitted Prior Art and Nadim teaches all of the features of the claimed invention except for using a neural net to calculate the error signals.

Trompf teaches a speech recognition system in a noise environment using a neural network performing neural noise reduction by reducing, in a training phase, a mapping error between noise-free vectors at an output of the neural network and noise-reduced vectors at the output of the neural network using an iterative process, and with the mapping error being further reduced by additional information which is selected from a suitable signal representation at the input of the neural network (column 1, line 61 to column 2, line 2).

It would have been obvious to one having ordinary skill in the art to modify the invention of the Applicant's Admitted Prior Art and Nadim to include using a neural net to calculate the error signals, as taught by Trompf, because a neural net is a well known tool for calculating an output based on a group of known inputs and, as

suggested by Trompf, the combination would have provided a method of noise reduction, in a short amount of time, that is accurate and able to discern between the noise that is being detected for removal, as well as extraneous environmental noise (column 2, lines 8-19 and column 3, lines 51-57).

12. Claims 8, 9, 17, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the Applicant's Admitted Prior Art in view of Nadim and further in view of U.S. Patent No. 5,499,301 to Sudo et al.

As noted above, the invention of the Applicant's Admitted Prior Art and Nadim teaches all of the features of the claimed invention except for specifying that the frequency of the noise be a multiple of a base frequency.

Sudo teaches an active noise canceling apparatus and also teaches that when the frequency of a power supply is a base frequency, the electromagnetic noise due to the power source frequency is observed to have a frequency peak at multiples of the base frequency (column 8, lines 34-41).

It would have been obvious to one having ordinary skill in the art to modify the invention of the Applicant's Admitted Prior Art and Nadim to include specifying that the frequency of the noise be a multiple of a base frequency, as taught by Sudo, because the Applicant's Admitted Prior Art teaches using the noise canceling method in a household appliance (page 4, lines 4-7) (which would inherently include a power supply) and Sudo teaches a well known fact relating the base frequency of the power supply and the frequency of the noise signal.

Response to Amendment

13. The amendment filed 21 January 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: Page 9, lines 4+ describes the makeup of the CRCP which was not presented in the original specification or drawings.

Applicant is required to cancel the new matter in the reply to this Office Action.

Response to Arguments

14. Claims 1 and 10 have been cancelled without prejudice.

15. With respect to the priority of the instant application, the wording has been changed to specify that only claims 7, 8, 16, and 17 do not receive the benefit of the priority dates.

16. With respect to the proposed drawing correction, although Applicant has amended the specification to explain the processing procedures not shown in the drawing, the drawings must also be modified to show these claimed features.

17. Applicant's arguments with respect to claims 1-18 have been considered but are

moot in view of the new ground(s) of rejection.

It is noted, however, that Applicant argues, “[n]owhere does Nadim disclose a mixer that generates an error variation signal. Nadim does not teach or suggest mixing a noise signal and a noise control signal to generate a residual noise signal and an error variation signal.” The Examiner maintains that Nadim does disclose generating an error signal by mixing the noise signal (N) with the noise control signal (C) (Equation 1) and, since the error variation signal is the difference between the current error signal and the previous error signal (equation 14), mixing the noise signal with the noise control signal also generates the error variance signal.

Applicant also argues, “none of the applied prior art discloses a phase perceiving part or method for transforming a noise signal, full-wave rectifying the transformed noise signal, converting the fully rectified signal and bandpass filtering the converted signal.” The Examiner maintains that Applicant’s Admitted Prior Art discloses a phase perceiving part (i.e. a DSP that produces a control signal having the same amplitude but opposite phase to that of a noise signal (page 2, lines 18-21)).

Further, claims 7 and 16 which include features for transforming a noise signal, full-wave rectifying the transformed noise signal, converting the fully rectified signal and bandpass filtering the converted signal are not rejected on their merits because it cannot be ascertained how these features are incorporated into the overall construction of the instant invention.

Conclusion

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18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

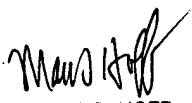
19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (703)308-1309. The examiner can normally be reached on Monday through Friday, 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marc S. Hoff can be reached on (703)308-1677. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-7382 for regular communications and (703)308-7382 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

jrw
March 7, 2003


MARC S. HOFF
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800